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**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Docket Number (Optional)

107351-00011

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on \_\_\_\_\_

Signature \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Application Number

09/822,414

Filed

April 2, 2001

First Named Inventor

Hiroya KIRIMURA et al.

Art Unit

1722

Examiner

SONG, Matthew

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.☐ assignee of record of the entire interest.  
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.  
(Form PTO/SB/96)☒ attorney or agent of record.  
Registration number 47,271☐ attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 \_\_\_\_\_

Signature

Rhonda L. Barton

Typed or printed name

202-857-6000

Telephone number

December 8, 2006

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below\*.

☒ \*Total of 1 forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of:

Confirmation No.: 9442

Hiroya KIRIMURA et al.

Art Unit: 1722

Application No.: 09/822,414

Examiner: M. Song

Filed: April 2, 2001

Attorney Dkt. No.: 107351-00011

For: FILM FORMING APPARATUS AND METHOD OF FORMING A  
CRYSTALLINE SILICON FILM

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

**MAIL STOP AF**

Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

December 8, 2006

Sir:

The Applicants request review of the Office Action mailed August 8, 2006, in the patent application identified above. No amendments are being filed with this request. This request is being filed with a Notice of Appeal.

## **REMARKS**

Claims 26-45 are pending in the subject application. The outstanding Office Action in the present application is the sixth Office Action in this application. Thus, this application qualifies for Appeal.

In the outstanding Office Action, claims 31, 33-34 and 37-40 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Asakawa et al. (U.S. Patent No. 5,795,385, "Asakawa") in view of Zhang et al. (U.S. Patent No. 5,766,344, "Zhang").

Claims 26-30, 35, 36 and 41-45 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Asakawa in view of Zhang and further in view of Selvakumar et al. (U.S. Patent No. 5,633,194, "Selvakumar").

Claim 32 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Asakawa in view of Zhang and further in view of Ahn et al. (U.S. Patent No. 5,470,619, "Ahn").

Claims 33-40 are independent claims. The Applicants respectfully traverse the rejections for the following reasons.

### **I. Essential Elements Omitted for a *Prima Facie* Obviousness Rejection**

The Applicants respectfully submit that none of the cited references disclose or suggest a pre-film having crystallinity that is then irradiated by an energy beam. With respect to claims 33, 34, 37 and 38, the combination of Asakawa and Zhang fails to disclose or suggest the claimed features of the invention. With respect to claims 35 and 36, the Applicants submit that Selvakumar fails to cure the deficiencies in Asakawa and Zhang. With respect to claim 32, the Applicants submit that Ahn fails to cure the deficiencies in Asakawa and Zhang.

As a preliminary matter, the Applicants respectfully submit that the Office Action overlooks the step of forming the pre-film by "while emitting the ion beam", as recited in

claims 33, 34, 37 and 38. The Applicants note the Office Action statement that “Asakawa et al teaches forming an amorphous silicon film on a substrate using plasma chemical vapor deposition, this clearly suggests applicant’s pre-film, while simultaneously irradiating the substrate with beams of low energy gas...” See page 2, lines 20-22 of the Office Action. However, there is no mention of the step of forming the pre-film by “while emitting the ion beam”, in the rejection. In contrast, Asakawa merely discloses two steps: plasma chemical vapor deposition and irradiating the substrate with beams of a low energy.

In addition, claims 33 and 34 recite that the energy beam irradiates the pre-film having crystallinity; and claims 37 and 38 recite that an energy beam irradiates the pre-film having a microcrystalline nucleus layer of silicon. As discussed above, the pre-film having crystallinity is formed by the combined film forming device and ion beam. In contrast, Asakawa does not disclose or suggest the steps of forming a pre-film having crystallinity and then irradiating said pre-film by an energy beam. Therefore, the Office Action position that the plasma chemical vapor deposition in Asakawa is comparable to the claimed pre-film and is simultaneously irradiated with a low energy gas does not meet the method steps of claims 33, 34, 37 and 38, because Asakawa does not disclose or suggest irradiating a pre-film having crystallinity formed by a combined film forming device and ion beam.

Claims 35 and 36 recite forming the pre-film which has a microcrystalline nucleus layer of silicon that is then irradiated by an energy beam. Claims 39 and 40 recite forming a pre-film having a microcrystalline nucleus layer, then irradiating. As such, each of claims 33-40 recites that the formation of the pre-film or the crystalline silicon film on the target surface of the substrate by the film forming device, while emitting the ion beam to the target surface of the substrate from an ion source **forms a pre-film having a crystallinity**.

In contrast, Asakawa discloses a method of forming a single-crystalline thin film of a prescribed material on a polycrystalline substrate or an amorphous substrate using plasma chemical vapor deposition by supplying a reaction gas onto the substrate under a low temperature allowing no crystallization of the prescribed material with the plasma chemical vapor deposition alone. See column 4, lines 54-61 of Asakawa. As such, Asakawa teaches away from that recited in claims 33-40 where a pre-film is formed with crystallinity.

Zhang fails to cure the deficiencies in Asakawa as Zhang also discloses preventing the film from being arisen of a silicon cluster, i.e., a part having a crystal, in the film forming process to the utmost. See column 5, lines 39-42 of Zhang. Zhang further discloses that even if a little of crystalline part was contained in the non-crystalline silicon film, it gave a bad influence on the crystallization in the later laser irradiation process. See column 5, lines 42-47 of Zhang. As such, both Asakawa and Zhang teach away from a pre-film having a crystallinity as recited in independent claims 33-40.

Selvakumar and Ahn further fail to teach or suggest the feature of locating a substrate in a film forming vacuum and forming a pre-film of a crystalline silicon film on a target surface of the substrate by a film forming device while emitting the ion beam to the target surface of the substrate from the ion source to form the pre-film having a crystallinity.

Under U.S. patent practice, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See M.P.E.P. § 2142.

In view of the above, the Applicants respectfully submit that Asakawa, Zhang, Selvakumar and Ahn, either singly or in combination, fail to disclose or suggest the all the claimed limitations. As such, the Office Action has failed to establish a *prima facie* case of obviousness for purposes of a rejection of claims 33-40 under 35 U.S.C. § 103.


Claims 26, 31 and 32 depend from claim 33; claim 41 depends from claim 34; claim 27 depends from claim 35; claims 30 and 42 depend from claim 36; claims 28 and 29 depend from claim 37; claims 43 and 44 depend from claim 38; claim 45 depends from claim 39, and are allowable for at least the same reasons.

## II. Conclusion

For all of the above reasons, review of the outstanding Office Action is respectfully requested, and a favorable decision and allowance of all pending claims, are earnestly solicited.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing Attorney Dkt. No. 107351-00011**.

Respectfully submitted,



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Enclosures: Notice of Appeal to the BPAI and Petition

For Extension of Time (one month)

Pre-Appeal Brief Request for Review (Form PTO/SB/33)